Cooperative Highway Planning And Research Program 1990-91: Part II

ENGINEERING RESEARCH AND DEVELOPMENT BUREAU
NEW YORK STATE DEPARTMENT OF TRANSPORTATION
Mario M. Cuomo, Governor/Franklin E. White, Commissioner

COOPERATIVE HIGHWAY PLANNING AND RESEARCH PROGRAM

PART II - 1990-91

HPR-0010(025)

March 1990

ENGINEERING RESEARCH AND DEVELOPMENT BUREAU
New York State Department of Transportation
State Campus, Albany, New York 12232

PREFACE

This work program is a statement of the transportation research and development activities that qualify for reimbursement from Federal Cooperative Highway Planning and Research funds. It describes the work that will be performed during the State fiscal year from April 1, 1990, through March 31, 1991.

Section I	Technical Assistance & Technology Transfer Program (p. 9)
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All allocations for salaries include a fringe benefit factor of 14.04 percent (annual salary x 1.1404), established by the Department of Audit and Control and the Division of the Budget, which represents the employer's share of workmen's compensation, hospitalization, retirement fund charges, and other contributions.

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TABLE 1
SUMMARY OF COOPERATIVE HIGHWAY PLANNING AND RESEARCH PROGRAM: PART II HPR-0010(025) FISCAL YEAR 1990-91

State Project Number	Project Title & Research Supervisor	Estimated Cost 1990-91	FTC	FPA	FPM
1-0	Transportation Research Correlation Service	$ 145,020			
10-01	Administration (p. 61)	220,000			
16-00	Training (All Sections)	25,000			
	Subtotal	$ 390,020			
TECHNICAL ASSISTANCE AND TECHNOLOGY TRANSFER PROGRAM (p. 9)					
11-0	Information Exchange	$ 145,000			
12-0	Consultation	280,000			
12-20	Deterioration of Substructure Concrete	4,000			
12-22	SHRP	30,000			
12-25	Polymer Concrete Bridge Deck Overlays	40,000			
12-26	Rutting of Flexible Pavement	40,000			
13-0	Implementation	10,000			
	Technical Assistance and Technology Transfer Subtotal	$ 549,000			
EXPERIMENTATION PROGRAM: TYPE A CONTINUING STUDIES (p. 25)					
142-2	Load Capacity of Concrete Bridge Decks (Dr. Fu)	$ 44,600	Shamis	Briggs	[1]Ballinger
157-1	Evaluation of Long-Life Pavement Marking Materials (Hiss)	25,000	Schauer	Growney	[3]Peart
161-1	Effects of Preventive Maintenance on Pavement Serviceability (Hiss)	35,000	Tabor	Strout	[2]Kopac
166-1	Cable Guiderail Tension (Hiss)	20,000	Conlan	Growney	[5]McDevitt
167-1	Accelerated Wear Tests of Pavement Marking Materials (Hiss)	7,000	Herritt	Hosley	[6]Niessner
176-1	Rigid Pavement Joint Rehabilitation (Hiss)	24,200	Conlan	Strout	[2]Larson
180-1	Traffic Barrier Performance Related to Vehicle Size (Hiss)	8,000	Beers	Growney	[5]Hargrave
188-1	Overlays on Faulted Concrete Pavements (Hiss)	42,400	Firmin	Strout	
197-1	Development of Roadside Accident Rates for Two-Lane Rural Hwys (Hiss)	10,000	Forando	Growney	[5]Freitas
199-1	Membranes for Pavement-Shoulder Joints (Hiss)	25,000	Schauer		[2]Kopac
202-1	Relating the AASHTO Design Guide to New York State Procedures (Hiss)	36,800	Conlan	Strout	[2]Larson
208-1	Inspection and Evaluation Tools for Bridges (Dr. Fu)	103,000	Formosa		
	Type A Continuing Studies Subtotal	$ 381,000			
EXPERIMENTATION PROGRAM: TYPE B CONTINUING STUDIES (p. 25)					
192-1	Effectiveness of Hand Signal Devices (Hiss)	$ 9,400	Moore		
206-1	Deck Treatment Service Lives (Dr. Fu)	18,800			
207-1	Bridge Inspection Automation (Neveu)	22,000	Formosa		
	Type B Continuing Studies Subtotal	$ 50,200			
EXPERIMENTATION PROGRAM: PRE-PROJECT PLANNING (p. 37)					
209-1	Proof Testing of Highway Bridges (Dr. Fu)	$ 1,000	Shamis		
210-1	Design of Leaching Basins (Neveu)	6,000	Formosa		
211-1	Incorporation of Paint Removal Waste into Low-Strength Concrete (Hiss)	$ 5,000	Formosa		
	Pre-Project Planning Subtotal	12,000			
EXPERIMENTATION PROGRAM: PROJECTS NOT YET INITIATED AND CONTINGENCIES (p. 41)					
	Projects Not Yet Initiated (Table 2)	$ 402,800			
	Contingencies	14,980			
	Grand Total HPR-0010(025) Part II FY 1990-91	$1,800,000			

*Superscript numbers indicate the Washington technical office having the following coordinating responsibility:

[1]HNR-10 Structures Division
[2]HNR-20 Pavement Division
[3]HNR-30 Materials Technology & Chemistry Division
[4]HSR-10 Systems Technology Division
[5]HSR-20 Safety and Design Division
[6]HRT-10 Engineering & Highway Operations Implementation Division
[7]HRT-20 Safety & Traffic Implementation Division

TABLE 2
PROJECTS NOT YET INITIATED: PART II
HPR-0010(025) FISCAL YEAR 1990-91

Project Number	Panel Ranking	Title	Estimated Cost 1990-91
ERTAP APPROVED FALL 1988			
88-17	1	Project 209-1 Proof Testing of Bridges	$ 42,800
88-12	7	Project 203-1 Alternative Paving Matls & Mix	55,000
88-23	8	Scour Inspection of Bridges	30,000
88-10	24	197-2 Roadside Clear Zone	40,000
ERTAP APPROVED FALL 1989			
89-18	2	Project 211-1 Incorporate Paint Removal Waste Into Low-Strength Concrete	$ 60,000
89-42	3	Effects of Titanium Dioxide (TiO_2) On Traffic Paint Performance	10,000
89-38	7	Determining Overload Capacity Of Bridges	47,000
89-37	8	Guidelines For Integrating Load Test Results Into Bridge Load Ratings	47,000
89-26	9	Project 210-1 Design of Leaching Basins	47,000
89-41	10	Evaluation of Design Methods for Sprayed Seals	24,000
		TOTAL	$ 402,800

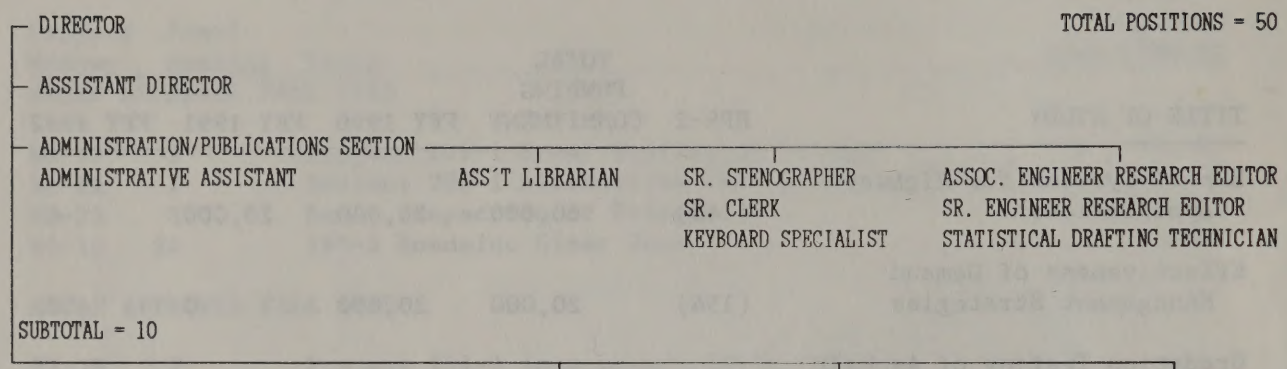
TABLE 3
100% HPR - POOLED FUND PROJECTS
HPR-0010(025) FISCAL YEAR 1990-91

TITLE OF STUDY	HPR-2	TOTAL FUNDING COMMITMENT	FFY 1990	FFY 1991	FFY 1992
Expert Systems for Highway Applications	(145)	60,000	20,000	20,000	0
Effectiveness of Demand Management Strategies	(154)	20,000	20,000	0	0
Gradation Testing of Asphalt Mixes	(153)	12,000	6,000	6,000	0
Guidelines for Developing and Implementing a Public Safety Awareness Campaign	(152)	8,000	4,000	4,000	0
National Geotechnical Experimentation Sites	(150)	20,000	10,000	5,000	5,000
Testing of Small and Large Sign Supports	(144)	40,000	15,000	15,000	10,000
Testing of State Roadside Systems	(146)	0	**	**	**
TOTAL		160,000	75,000	50,000	15,000

** Obligated funds for this study will be equal to the cost of any requested testing.

New York State Department of Transportation
Engineering Research and Development Bureau

FIGURE 1: ORGANIZATIONAL STRUCTURE



	STRUCTURES	MATERIALS/PAVEMENTS	T^2/IMPLEMENTATION/ SPECIAL SERVICES
ENGINEERING RESEARCH SPECIALIST I	1	1	1
ENGINEERING RESEARCH SPECIALIST II	2	2	2
ASSOC. STATISTICIAN			1
CIVIL ENGINEER I	3	7	4
JUNIOR ENGINEER	2	2	3
LAB EQUIPMENT DESIGN	1		
ELECTRONIC EQUIPMENT MECHANIC	1		
PRINCIPAL ENGINEERING TECHNICIAN			3
SENIOR ENGINEERING TECHNICIAN			3
INTERN	1		
SUBTOTAL = 40	11	12	17

SECTION I

TECHNICAL ASSISTANCE & TECHNOLOGY TRANSFER PROGRAM

PROJECT: 11-0 INFORMATION EXCHANGE

PROBLEM: N.A.

OBJECTIVE: N.A.

SCOPE: As the title implies, this project covers the activities which provide for the transfer of technical information from one party to another. The Bureau's Research Digest, a quarterly publication, is prepared and published under this project. The Research Digest serves as a medium to inform the Department, other States, FHWA, research agencies, various levels of government, and others, of research results, newly-initiated projects, and reports that are concerned with Experimental Features, Demonstration Projects, and implementation activities. Other activities charged to this project include coordination of Experimental Feature Work Plans, support activities to the NCHRP Program, coordination of pooled funded projects, publishing of the TNT news letter, all activities in support of ERTAP, receipt and dissemination of reports, correspondence, and bulletins. Files have been established for each project and a distribution list of Departmental and other personnel has been established. In addition to the Digest and the Technology Transfer functions, work conducted under this project is in response to requests by Department Program Managers, and in support of the Bureau's experimental programs. It consists of providing access to current technical information through the maintenance of a collection of technical literature; state-of-the-art reviews; inquiries to various technical information services, industry, other states, and Department staff; and attendance at technical meetings and seminars. Examples of work performed under this project during FY 1990-91 included:

1. A summary of the TRB proceedings attended by Department staff was distributed to the Commissioner's Office, Offices of Engineering, Operations, Public Transportation, Management and Finance, Human Resources, Legal Affairs, and the Program Planning and Management Group. Copies were also provided for each Regional Director and Regional Group Directors. A total of 150 copies were distributed.

2. Presentations were made to the Regional Directors and Group Directors in all regions describing the procedures in developing the Department's on-going research program.

3. The first meeting of the ERTAP and Main Office and Regional Liaison persons was held on April 17, 1989. Twenty persons were in attendance from the Main Office and Regions.

4. The Bureau is providing oversight in the following URTC projects:

-Infrastructure Risk Management: Prioritizing Bridges for Maintenance and Rehabilitation; P.I. - E. Vanmarcke and C. Turkstra; Princeton University

-Expert System for Concrete Quality Assurance; P.I. - T. Williams; Rutgers State University of New Jersey

-Expert System for Steel Bridge Superstructure Inspection and Evaluation; P.I. - Stuart Chen; State University of New York

A meeting was held on January 21, 1990, to review the progress in the expert system for Concrete Quality Assurance.

5. We were informed on April 10, 1989, by Robert Baker of New Jersey DOT that New Jersey is going to adopt as a standard the New York Connections for Temporary New Jersey Barrier. Their decision was based upon our research results showing the effectiveness of the connection detail.

6. Prasanta Gupta, Thomas Van Bramer, Hong-Jer Chen, Michael Doody, and Ashley Tyrell visited several DOT Units: Design, Structures, Mapping Services, Equipment Management, Waterways Maintenance, and Engineering Resource Systems to discuss the operations of the the Engineering Research and Development Bureau and the procedures for initiating suggestions for the Department's ongoing Research Program.

7. Prasanta Gupta attended a joint AGC/DOT Specification Committee meeting on April 13, 1989.

8. Dave Beal gave a presentation on the subject of bolt hole cracking in steel culverts at the University of Buffalo.

9. Dave Beal gave a presentation on culvert inspection techniques at the Annual Bridge Inspector's Meeting.

10. Ashley Vaughn of the North Carolina DOT requested copies of the following NYSDOT's Research Reports:

    Research Report 57 - "Performance of Highway Safety Devices"
    Research Report 85 - "Crash Tests of Light-Post Thrie-Beam Traffic Barriers"
    Research Report 87 - "Experimental Pavement Delineation Treatments"
    Research Report 111 - "Development of Proposed Height Standards and Tolerances for Light-Post Traffic Barriers"

11. Prasanta Gupta, Ashley Tyrell, and Jan Fortuniewicz attended the Design Engineer's Meeting.

12. Pat Corkle of the Minnesota DOT requested copies of Special Report 87, "Traffic Barrier Performance Related to Passenger Car Characteristics" and Research Report 111, "Development of Proposed Height Standards and Tolerances for Light-Post Traffic Barriers."

13. The Bureau was requested to assist in developing a questionnaire regarding national use of epoxy-coated rebars in bridge decks. Ultimately, the answers will aid in answering the question, "Are epoxy coated bottom bars in bridge decks warranted?"

14. Initial training on the use of portable computers during bridge inspections was provided to three bridge inspectors.

15. Dr. Michael I. Darter from the University of Illinois, Urbana-Champaign, requested data on New York State overlaid pavements to be used in coordinating the revision of the AASHTO Overlay Design Guide.

16. Frank Henry of the Thruway Authority requested the following Research Reports:

Special Report 87 - "Traffic Barrier Performance Related to Passenger Car Characteristics"
Research Report 83 - "Crash Tests of Sharply-Curved Light-Post Guiderails"
Research Report 85 - "Crash Tests of Light-Post Thrie-Beam Traffic Barriers"
Research Report 92 - "Crash Tests of Box-Beam Upgradings for Discontinuous -Panel Bridge Railing"
Research Report 102 - "Crash Tests of Portable Concrete Median Barrier for Maintenance Zones"
Research Report 111 - "Development of Proposed Height Standards and Tolerances for Light-Post Traffic Barriers"
Research Report 142 - "W-Beam Guiderail Transition from Light to Heavy Posts"
Research Report 144 - "Box-Beam Terminals for Restricted Condition"

17. Bill Prodo of HNTS Consultants of Boston, Massachusetts, requested the following Research Reports:

Research Report 67-1 - "New Highway Barriers: The Practical Application of Theoretical Design"
Research Report 38 - "Testing of Highway Barriers and Other Safety Accessories"
Research Report 51 - "In-Service Performance of Highway Barriers"
Research Report 57 - "Performance of Highway Safety Devices"
Research Report 83 - "Crash Tests of Sharply-Curved Light-Post Guiderails"

Research Report 111 - "Development of Proposed Height Standards and Tolerances for Light-Post Traffic Barriers"
Research Report 142 - "W-Beam Guiderail Transition from Light to Heavy Posts"
Research Report 144 - "Box-Beam Terminals for Restricted Conditions"

18. The ERTAP Panel met on October 16, 1989, and selected a program of proposed research for FY 1990-91. This program was approved by Chief Engineer Cuddy on October 25, 1989. All Department Directors, Program Managers, and Regional Directors were informed of the program content on October 27, 1989

19. The Bureau represented the Department at the annual NYSATE Conference. Technology Transfer played a major role in the presentation format of the display. On-site literature searches were performed for interested participants. A significant increase in search requests are expected as a result of the conference.

20. Prasanta Gupta, Ashley Tyrell, and Hong-Jer Chen attended the Structures Engineers' Meeting.

21. Hong-Jer Chen attended the Materials Engineers' Meeting.

22. The first issue of Technology News Transfer (T.N.T.) newsletter was published and distributed. It is the Bureau's intent that distribution be to all engineers within the Department. Response has been excellent to the newsletter.

23. Manuals were prepared and distributed and training provided to the Materials Bureau on how to perform mechanistic tests on asphalt concrete.

24. Hong-Jer Chen and Michael Doody attended a committee meeting held by the Materials Bureau and Empire State Concrete and Aggregate Producers Association.

25. Michael Doody and Hong-Jer Chen attended TRB meetings in Washington, D.C. Mr. Doody attended as a representative of the Department.

26. Idris Aziz attended a presentation by Trefor Williams of Rutgers University on the use of expert systems for concrete mix design.

27. The Engineering Research and Development Bureau has enhanced our library facilities. The following is a summary of some activities performed by our librarian:

- Reference Questions - 777
- Inter-Library Loans - 270

Project 11-0

- Reports Requested - 98
- New Acquisitions - 363
- Literature Searches - 218
- Circulation - 833

STATUS: Continuing

ESTIMATED EXPENDITURES FOR FY 1990-91: $145,000

CLIENTS: All Department Units

PROJECT: 12-0 CONSULTATION

SCOPE: This project provides a means of rendering advice and/or services in various areas of engineering technology and research methodology, such as the design of experiments, instrumentation, and statistical analysis, for which the Bureau staff is uniquely qualified or equipped. Some activities conducted under this project during FY 1990-91 included:

1. During FY 1989-90 the Engineering Research and Development Bureau completed four major research studies and published thirteen additional engineering reports which addressed current Department problems. The benefits to the public flowing from these efforts are estimated to be in excess of $3.3 million over the next five years. One of the reports, "Traffic Flow Theory and Chaotic Behavior," written in cooperation with Dr. Frame of Union College, was accepted for publication by the Transportation Research Board. Another "User's Manual for Mandel (Version 1.0): Applied Regression in the Presence of X-Error," received a written compliment from the New Jersey Department of Transportation.

2. Continuous Decks on Simple Span Bridges - the Structures Section completed an investigation of jointless bridge deck designs for the Structures Design and Construction Division. The results of the study reported on in Client Report 43, "A Review of Jointless Deck Designs," showed that continuous deck designs were feasible and could result in significant savings to the Department. It was estimated that a total elimination of bridge joints in both new and rehabilitation design would result in an average annual savings of $4 million.

3. The Structures Section completed the final report for Project 12-14, "Design Methods for Corrugated Metal Culverts." Client Report 42, "Corrugated Metal Culvert Design," describes a microcomputer based culvert design program which was developed during the study, as well as other significant accomplishments of the project. The culvert design program is currently being used on a regular basis by the Structures Design and Construction Division.

4. Cross Bronx Expressway - Resilient and Creep modulus testing was completed on nine Marshall specimens and four pavement cores. Multilayer elastic analyses were performed using laboratory generated data. A letter report was submitted to the Materials Bureau indicating that the 1988 materials showed

no improvement over 1987 materials. Creep testing indicated some improvement.

5. Project 12-19 - Range Method results have been incorporated in Engineering Bulletin (EB-89-12) - Documentation for Changes to Job Mix Formula. The bulletin guidelines are to be applied to projects located where there is a high potential for rutting.

6. The Structures Engineer in Region 2 (Utica) requested assistance regarding an abnormally high rate of luminaire burnout on the Marcy-Utica-Deerfield project. The Bureau conducted a study to determine whether this was being caused by electrical wiring problems, defective electronic components, or pole vibration. The manufacturer admitted that they had some quality control problems which may have resulted in the burnout. The Bureau supplied the Region with a list of other manufacturers to contact.

7. Client Report 44, "1988 Visual Inspection of Isotopic Bridge Decks," was completed and transmitted to the Structures Design and Construction Division. The report discussed the results of the annual visual inspection program. No problems with the isotopic reinforcement were encountered.

8. Consultations were held with Region 11 (New York City) regarding the high-curb systems for use of Route 9A Arterial.

9. Responses to a national survey on the use of epoxy-coated rebars in bridge decks were analyzed and forwarded to the Bridge Office. The results will be used to formulate a policy regarding epoxy coating on both top and bottom mats in monolithic bridge decks.

10. Everett Dillon and William Deschamps worked in a steel fabrication plant in Lancaster, Pennsylvania, attaching strain gauges to curved girders prior to their installation in Ossining, New York. The Bureau will be monitoring the structure this spring at the request of the Structures Design and Construction Division.

11. Michael Francese, Regional Director for Region 11 (New York City), requested information on graffiti. The Bureau contacted other states and transportation agencies across the country to determine what is being done to reduce and control the amount of graffiti on highway structures. As a result of this effort, our New York City Regional Office now has an up-to-date list of the policies and practices used by various leaders in the field of graffiti control and reduction.

Project 12-0

12. The evaluation of 8" Roundel vs. 12" Roundel railroad grade crossing signal units was completed for the Commercial Transport Division.

STATUS: Continuing

ESTIMATED EXPENDITURES FOR FY 1990-91: $280,000

CLIENTS: All Department Heads

PROJECT: 12-20 PROTECTION OF SUBSTRUCTURE CONCRETE

PROJECT MANAGER: M.E. Doody

PROBLEM: Reinforced concrete that forms the supporting structure for bridges is vulnerable to the same mode of damage that has been so harmful to decks - i.e., corrosion of embedded steel reinforcement in a chloride-rich environment. Surfaces beneath deck joints or within the roadway splash zone are particularly vulnerable. A 1979-80 NYSDOT study (ER&DB Special Report 73) concluded that the concrete in some substructure elements of 10 to 15 year old bridges was beginning to exhibit damage, and predicted that the problem could become critical in the near future. Since then, the Department has used epoxy-coated rebars in new substructure elements exposed to chlorides, but has made no effort to protect concrete in existing substructures.

The potential severity of this problem warrants immediate attention. Protection and repair of substructure concrete has been described as possibly the next "maintenance crisis" to face highway agencies. The fact that corrosion damage develops in substructures at a slower rate than in decks allows more time to mobilize protective strategies. However, the options are fewer than with decks and valuable time has already been lost.

OBJECTIVE: To propose a long-term program for preservation of concrete substructure elements of bridges.

SCOPE: While it is likely that the eventual scope of this project will be considerably larger, at this time the Structures Division has asked:

1. That the present condition of substructure concrete elements be summarized from current computer-stored condition ratings and compared with a similar summary done in 1979-80 (reported in SR 73); methods for accomplishing this portion of the scope are being reviewed; and

2. That the field survey done in 1979-80 be duplicated to determine the rate of change in condition of the substructure elements inspected at that time.

STATUS: This project is in the process of being modified.

ESTIMATED EXPENDITURES FOR FY 1990-91: $4,000

CLIENTS: Structures Division, (Structural Concrete Committee)

PROJECT: 12-22 SHRP LTPP COOPERATIVE TASKS

PROJECT MANAGER:

PROBLEM: Major agencies involved in pavement design, construction, and management, recognizing the need for a national data base to include long-term data from highway monitoring, joined together to develop recommendations for meeting this objective. AASHTO approved the recommendations of the Strategic Transportation Research Study and established the "Strategic Highway Research Program (SHRP)" to carry them out. Under the provisions of Surface Transportation and Uniform Relocation Assistance Act of 1987, one-quarter of one percent of state-apportioned federal highway aid is allocated to SHRP for highway research.

OBJECTIVE: To provide the staffing and expertise to coordinate SHRP LTPP efforts in New York State.

SCOPE: Bureau and other Department personnel will provide data for test pavement selection, test pavement inventory data, liaison with the Regions for providing necessary services during monitoring and sampling phases of the study.

The following information indicates some of the activities which were performed in relation to SHRP functions:

1. James Tanski and Ashley Tyrell coordinated verification activities at five additional SHRP General Pavement Section sites.

2. James Tanski informed residencies of SHRP's PASCO photographing system schedule and arranged for signing of three additional General Pavement Section sites.

3. James Tanski arranged for utilities clearance and traffic control at SHRP's LTPP - General Pavement Section sites scheduled for drilling and sampling.

4. James Tanski attended a meeting in Syracuse between SHRP and the county engineers involved with the SHRP LTPP - General Pavement Section sites.

5. Prasanta Gupta attended a two-day NCHRP AAMAS-SHRP coordination meeting in Washington, DC.

6. Ashley Tyrell, Jan Fortuniewicz, Thomas Van Bramer, Rick Morgan, and Roger Hordines attended SHRP's demonstration of its profolometer.

7. Signs for the three additional General Pavement Section sites were delivered to the respective residencies. Two SPS sites were established adjacent to General Pavement Section sites in Regions 1 (Albany) and 7 (Watertown).

8. Ashley Tyrell attended SHRP's NARCO meeting in Hartford, Connecticut.

9. Copies of SHRP's revised "Maintenance Data Collection Guide" were sent to six residencies having General Pavement Section sites.

10. James Tanski attended a meeting with SHRP's representative, Ivan Pecnik.

STATUS: Continuing.

ESTIMATED EXPENDITURES FOR FY 1990-91: $30,000

CLIENTS:

PROJECT: 12-25 POLYMER CONCRETE BRIDGE DECK OVERLAYS

PROJECT MANAGER: M.E. Doody

PROBLEM: Bridge deck deterioration due to reinforcement corrosion caused by chloride infiltration continues to be a major problem for most state highway departments. Methods currently used by New York to protect reinforcing steel from corrosion include low-slump and latex-modified concrete overlays. Performance of these overlay systems has been variable. Alternative deck overlay materials are needed that will enhance protection of reinforcement in concrete bridge decks.

OBJECTIVE: To determine whether polymer-concrete overlays are a viable alternative to current materials, and to evaluate workability, cost, and durability of these materials.

SCOPE: A thorough literature search regarding use of polymer concrete in transportation facilities wil be performed. All existing methods and materials should be identified and documented as part of the evaluation. A recommendation will be made as to suitability of polymer concrete as an overlay material in New York.

STATUS: Continuing

ESTIMATED EXPENDITURES FOR FY 1990-91: $40,000

CLIENTS: Materials Bureau
Highway Maintenance Division

PROJECT: 12-26 RUTTING OF FLEXIBLE PAVEMENTS

PROJECT MANAGER: J.H. Tanski

PROBLEM: Asphalt concrete pavements in New York including I-87, the Cross-Bronx Expressway, and others are experiencing premature rutting. Also, this phenomenon has been reported throughout much of the United States and has become a major concern for state highway departments.

Rutting has a major impact on pavement performance. According to the AASHTO design equation, a 1.1-in. deep rut reduces pavement serviceability (PSI) of new pavements, having no other distress, from 4.2 to 2.5. The AASHTO Guide for Design of Pavement Structures suggests that major highways be maintained at PSI levels above 2.5. With this much loss in serviceability the entire life of the pavement has in effect been lost. Deep ruts also create safety hazards in terms of vehicle handling and hydroplaning. In addition, premature rutting is a public relations problem for all segments of the highway building community -- public agencies and industry. It is thus necessary to investigate measures that can be implemented to minimize premature rutting.

OBJECTIVE: To investigate and summarize measures that can be implemented to reduce occurrences of premature rutting in New York flexible pavements.

SCOPE: Literature will be reviewed and specifications of various agencies compared with NYSDOT's Recommendations regarding mix design, pavement design, and construction practices are anticipated at conclusion of this project.

STATUS: Continuing

EXTIMATED EXPENDITURES FY 1990-91: $40,000

CLIENT: Materials Bureau

PROJECT: 13-0 IMPLEMENTATION

SCOPE: Activities conducted under this project are directed at cooperating with Department staff in implementing the results of research conducted by the Bureau and by other agencies. In the case of in-house research, this project permits "implementation follow-through" after the research projects are completed and terminated.

STATUS: Continuing

ESTIMATED EXPENDITURES FOR FY 1990-91: $10,000

CLIENTS: All Department Heads

SECTION II

EXPERIMENTATION PROGRAM
TYPE A & B CONTINUING STUDIES

PROJECT: R01001881 TITLE : ADMINISTRATION
SECTION: ADMINISTRATION INVESTIGATOR: ALL SECTIONS
CLIENT :
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 200000

PROJECT INITIATION DATE : 04/01/1989
STUDY PROPOSAL DUE : 09/28/1989
STUDY PROPOSAL COMPLETED: 04/01/1989
STUDY PROPOSAL APPROVED : 04/01/1989
ORIGINAL COMPLETION DATE: 03/31/1990
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	210578	210578	200000	200000	169231	169231
TOTAL COSTS	210578	210578	200000	200000	169231	169231

PROJECT: R01100881 TITLE : INFORMATION EXCHANGE
SECTION: ADMINISTRATION INVESTIGATOR: ALL SECTIONS
CLIENT : VARIOUS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 125000

PROJECT INITIATION DATE : 04/01/1989
STUDY PROPOSAL DUE : 09/28/1989
STUDY PROPOSAL COMPLETED: 04/01/1989
STUDY PROPOSAL APPROVED : 04/01/1989
ORIGINAL COMPLETION DATE: 03/31/1990
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	102733	102733	125000	125000	105769	105769
TOTAL COSTS	105505	105505	125000	125000	105769	105769

PROJECT: R01200881 TITLE : CONSULTATION
SECTION: ADMINISTRATION INVESTIGATOR: ALL SECTIONS
CLIENT : VARIOUS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 238000

PROJECT INITIATION DATE : 04/01/1989
STUDY PROPOSAL DUE : 09/28/1989
STUDY PROPOSAL COMPLETED: 04/01/1989
STUDY PROPOSAL APPROVED : 04/01/1989
ORIGINAL COMPLETION DATE: 03/31/1990
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	235509	235509	238000	238000	201385	201385
TOTAL COSTS	237032	237032	238000	238000	201385	201385

PROJECT: R01220881 TITLE : PROTECTION SUBSTRUCTURE CONCRETE
SECTION: MATER./PAVING INVESTIGATOR: DOODY
CLIENT : STRUCTURES
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 32500

PROJECT INITIATION DATE : 05/24/1988
STUDY PROPOSAL DUE : 11/20/1988
STUDY PROPOSAL COMPLETED: 06/08/1988
STUDY PROPOSAL APPROVED : 06/10/1988
ORIGINAL COMPLETION DATE: 03/31/1989
REVISED COMPLETION DATE : 09/30/1990
REVISION NUMBER : 2

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	9846	30690	22500	32500	19038	29038
TOTAL COSTS	10080	31127	22500	32500	19038	29038

PROJECT: R01222881 TITLE : SHRP
SECTION: MATER./PAVING INVESTIGATOR: TANSKI
CLIENT : N/A
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 200000

PROJECT INITIATION DATE : 07/07/1988
STUDY PROPOSAL DUE : 01/03/1989
STUDY PROPOSAL COMPLETED: 07/12/1988
STUDY PROPOSAL APPROVED : 07/12/1988
ORIGINAL COMPLETION DATE: 03/31/1993
REVISED COMPLETION DATE : 03/31/1993
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	39065	57314	80000	200000	67692	97692
TOTAL COSTS	41209	60134	80000	200000	67692	97692

PROJECT: R01225881 TITLE : POLYMER CONCRETE BRIDGE DECK OVERLA
SECTION: MATER./PAVING INVESTIGATOR: DOODY
CLIENT : MATERIALS/HIGHWAY MAINTENANCE
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 5000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 50000

PROJECT INITIATION DATE : 01/26/1990
STUDY PROPOSAL DUE : 07/25/1990
STUDY PROPOSAL COMPLETED: 03/14/1990
STUDY PROPOSAL APPROVED : 03/14/1990
ORIGINAL COMPLETION DATE: 10/31/1991
REVISED COMPLETION DATE : 10/31/1991
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	No Ias Costs on File		0	55000	0	0
TOTAL COSTS	No Ias Costs on File		0	55000	0	0

PROJECT: R01226881 TITLE : RUTTING OF FLEXIBLE PAVEMENTS
SECTION: MATER./PAVING INVESTIGATOR: TANSKI
CLIENT : MATERIALS/HIGHWAY MAINTENANCE
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 5000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 50000

PROJECT INITIATION DATE : 02/16/1990
STUDY PROPOSAL DUE : 08/15/1990
STUDY PROPOSAL COMPLETED: 02/16/1990
STUDY PROPOSAL APPROVED : 02/22/1990
ORIGINAL COMPLETION DATE: 09/30/1991
REVISED COMPLETION DATE : 09/30/1991
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	No Ias Costs on File		5000	55000	4231	4231
TOTAL COSTS	No Ias Costs on File		5000	55000	4231	4231

PROJECT: R01300881 TITLE : IMPLEMENTATION
SECTION: ADMINISTRATION INVESTIGATOR: ALL SECTIONS
CLIENT : VARIOUS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 2000

PROJECT INITIATION DATE : 04/01/1989
STUDY PROPOSAL DUE : 09/28/1989
STUDY PROPOSAL COMPLETED: 04/01/1989
STUDY PROPOSAL APPROVED : 04/01/1989
ORIGINAL COMPLETION DATE: 03/31/1990
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	1719	1719	2000	2000	1692	1692
TOTAL COSTS	1719	1719	2000	2000	1692	1692

PROJECT: R01600881 TITLE : TRAINING
SECTION: ADMINISTRATION INVESTIGATOR: ALL SECTIONS
CLIENT : VARIOUS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 16000

PROJECT INITIATION DATE : 04/01/1989
STUDY PROPOSAL DUE : 09/28/1989
STUDY PROPOSAL COMPLETED: 04/01/1989
STUDY PROPOSAL APPROVED : 04/01/1989
ORIGINAL COMPLETION DATE: 03/31/1990
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	15364	15364	16000	16000	13538	13538
TOTAL COSTS	18042	18042	16000	16000	13538	13538

PROJECT: R14202881 TITLE : LOAD CAPACITY CONCRETE BRIDGE DECKS
SECTION: STRUCTURES INVESTIGATOR: DR. FU
CLIENT : STRUCTURES
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 3500
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 550000

PROJECT INITIATION DATE : 04/03/1978
STUDY PROPOSAL DUE : 09/30/1978
STUDY PROPOSAL COMPLETED: 07/03/1978
STUDY PROPOSAL APPROVED : 09/14/1978
ORIGINAL COMPLETION DATE: 08/31/1979
REVISED COMPLETION DATE : 03/31/1992
REVISION NUMBER : 4

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	23544	447532	44600	485600	37738	478738
TOTAL COSTS	37420	539648	44600	550000	37738	548138

PROJECT: R15701881 TITLE : EVAL LONG-LIFE PAV MARKING MATERIAL
SECTION: MATER./PAVING INVESTIGATOR: LORINI
CLIENT : TRAFFIC
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 6000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 500000

PROJECT INITIATION DATE : 04/01/1978
STUDY PROPOSAL DUE : 09/28/1978
STUDY PROPOSAL COMPLETED: 08/09/1978
STUDY PROPOSAL APPROVED : 10/20/1978
ORIGINAL COMPLETION DATE: 12/31/1983
REVISED COMPLETION DATE : 03/31/1991
REVISION NUMBER : 3

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	21917	336362	24000	420961	20308	345169
TOTAL COSTS	23018	391358	24000	500000	20308	424208

PROJECT: R16101881 TITLE : EFF PREVENTIVE MAINT PAVEMENT SERV
SECTION: MATER./PAVING INVESTIGATOR: HISS
CLIENT : MAINTENANCE
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 3000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 905000

PROJECT INITIATION DATE : 05/21/1979
STUDY PROPOSAL DUE : 11/17/1979
STUDY PROPOSAL COMPLETED: 06/19/1979
STUDY PROPOSAL APPROVED : 09/11/1979
ORIGINAL COMPLETION DATE: 03/15/1988
REVISED COMPLETION DATE : 03/15/1990
REVISION NUMBER : 1

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	5394	795752	25000	771378	21154	767532
TOTAL COSTS	5394	897633	25000	905000	21154	901154

PROJECT: R16601881 TITLE : CABLE GUIDERAIL TENSION
SECTION: MATER./PAVING INVESTIGATOR: CHEN
CLIENT : DESIGN
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 6000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 280000

PROJECT INITIATION DATE : 12/26/1979
STUDY PROPOSAL DUE : 06/23/1980
STUDY PROPOSAL COMPLETED: 05/08/1980
STUDY PROPOSAL APPROVED : 06/11/1980
ORIGINAL COMPLETION DATE: 12/30/1982
REVISED COMPLETION DATE : 11/30/1990
REVISION NUMBER : 2

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	737	221405	29000	249800	24538	245338
TOTAL COSTS	737	229974	29000	280000	24538	275538

PROJECT: R16701881 TITLE : ACCEL WEAR TESTS PAV MARKING MAT
SECTION: MATER./PAVING INVESTIGATOR: LORINI
CLIENT : MAINTENANCE
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 6000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 376000

PROJECT INITIATION DATE : 04/09/1981
STUDY PROPOSAL DUE : 10/06/1981
STUDY PROPOSAL COMPLETED: 06/11/1981
STUDY PROPOSAL APPROVED : 08/03/1981
ORIGINAL COMPLETION DATE: 03/31/1984
REVISED COMPLETION DATE : 06/30/1990
REVISION NUMBER : 3

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	2012	355445	6000	376000	5077	375077
TOTAL COSTS	2012	368720	6000	376000	5077	375077

PROJECT: R17601881 TITLE : RIGID PAVEMENT JOINT REHABILITATION
SECTION: MATER./PAVING INVESTIGATOR: DOODY
CLIENT : MAINTENANCE
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 3000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 261200

PROJECT INITIATION DATE : 04/08/1982
STUDY PROPOSAL DUE : 10/05/1982
STUDY PROPOSAL COMPLETED: 05/26/1982
STUDY PROPOSAL APPROVED : 07/06/1982
ORIGINAL COMPLETION DATE: 03/31/1989
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 2

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	906	209947	30000	261200	25385	256585
TOTAL COSTS	906	236957	30000	261200	25385	256585

PROJECT: R18001881 TITLE : TRAFF BARRIER PERF RELATED VEH SIZE
SECTION: MATER./PAVING INVESTIGATOR: HISS
CLIENT : DESIGN
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 5000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 350500

PROJECT INITIATION DATE : 01/07/1983
STUDY PROPOSAL DUE : 07/06/1983
STUDY PROPOSAL COMPLETED: 06/20/1983
STUDY PROPOSAL APPROVED : 08/16/1983
ORIGINAL COMPLETION DATE: 06/30/1986
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 2

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	No Ias Costs on File		4000	310000	3385	309385
TOTAL COSTS	No Ias Costs on File		4000	350500	3385	349885

PROJECT: R18801881 TITLE : OVERLAYS FAULTED CONCRETE PAVEMENTS
SECTION: MATER./PAVING INVESTIGATOR: MORGAN
CLIENT : MATERIALS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 3000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 265000

PROJECT INITIATION DATE : 08/20/1984
STUDY PROPOSAL DUE : 02/16/1985
STUDY PROPOSAL COMPLETED: 12/05/1984
STUDY PROPOSAL APPROVED : 03/12/1985
ORIGINAL COMPLETION DATE: 03/31/1990
REVISED COMPLETION DATE : 10/20/1991
REVISION NUMBER : 1

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	36149	236092	45000	233900	38077	226977
TOTAL COSTS	37465	271406	45000	265000	38077	258077

PROJECT: R19201881 TITLE : EFFECTIVENESS HAND SIGNAL DEVICES
SECTION: MATER./PAVING INVESTIGATOR: SARIDIS
CLIENT : MAINTENANCE
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 5000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 139800

PROJECT INITIATION DATE : 07/24/1985
STUDY PROPOSAL DUE : 01/20/1986
STUDY PROPOSAL COMPLETED: 11/25/1985
STUDY PROPOSAL APPROVED : 01/31/1986
ORIGINAL COMPLETION DATE: 03/31/1988
REVISED COMPLETION DATE : 03/31/1990
REVISION NUMBER : 3

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	1877	124175	12000	134300	10154	132454
TOTAL COSTS	1877	129586	12000	139800	10154	137954

PROJECT: R19701881 TITLE : DEV ROADSIDE ACC RATE/2LANE RUR HWY
SECTION: MATER./PAVING INVESTIGATOR: PERRY
CLIENT : DESIGN
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 6000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 255000

PROJECT INITIATION DATE : 05/12/1986
STUDY PROPOSAL DUE : 11/08/1986
STUDY PROPOSAL COMPLETED: 12/04/1986
STUDY PROPOSAL APPROVED : 02/23/1987
ORIGINAL COMPLETION DATE: 06/30/1989
REVISED COMPLETION DATE : 04/30/1990
REVISION NUMBER : 2

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	8865	207616	35000	255000	29615	208615
TOTAL COSTS	8865	214286	35000	255000	29615	208615

PROJECT: R19901881 TITLE : MEMBRANES PAVE SHOULDER JOINTS
SECTION: MATER./PAVING INVESTIGATOR: TANSKI
CLIENT : MATERIALS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 4000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 175700

PROJECT INITIATION DATE : 11/28/1986
STUDY PROPOSAL DUE : 05/27/1987
STUDY PROPOSAL COMPLETED: 03/02/1987
STUDY PROPOSAL APPROVED : 05/29/1987
ORIGINAL COMPLETION DATE: 03/31/1993
REVISED COMPLETION DATE : 03/31/1993
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	18457	51923	42000	175700	35538	88538
TOTAL COSTS	19940	56449	42000	175700	35538	88538

PROJECT: R20201881 TITLE : AASHTO DES GUIDE TO NYS PROCEDURES
SECTION: MATER./PAVING INVESTIGATOR: CHEN
CLIENT : DESIGN
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 9000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 292250

PROJECT INITIATION DATE : 01/09/1987
STUDY PROPOSAL DUE : 07/08/1987
STUDY PROPOSAL COMPLETED: 07/09/1987
STUDY PROPOSAL APPROVED : 09/17/1987
ORIGINAL COMPLETION DATE: 09/15/1990
REVISED COMPLETION DATE : 09/15/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	12345	32332	33000	287850	27923	225928
TOTAL COSTS	12384	32501	33000	292250	27923	230323

PROJECT: R20301881 TITLE : ALTERNATIVE PAVING MATERIAL & MIXES
SECTION: MATER./PAVING INVESTIGATOR: VANBRAMER
CLIENT : MATERIALS
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 15000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 0

PROJECT INITIATION DATE : 05/21/1987
STUDY PROPOSAL DUE : 11/17/1987
STUDY PROPOSAL COMPLETED: 11/11/1911
STUDY PROPOSAL APPROVED : 11/11/1911
ORIGINAL COMPLETION DATE: 11/11/1911
REVISED COMPLETION DATE : 11/11/1911
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	3040	13393	4000	15000	3385	14385
TOTAL COSTS	3040	13393	4000	15000	3385	14385

PROJECT: R20601881 TITLE : DECK TREATMENT SERVICES LIVES
SECTION: STRUCTURES INVESTIGATOR: PEZZE
CLIENT : STRUCTURES
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 5000
ACTUAL STUDY PROPOSAL AMOUNT : 2000
APPROVED ORIGINAL BUDGET AMOUNT: 83300

PROJECT INITIATION DATE : 05/18/1988
STUDY PROPOSAL DUE : 11/14/1988
STUDY PROPOSAL COMPLETED: 04/13/1989
STUDY PROPOSAL APPROVED : 05/16/1989
ORIGINAL COMPLETION DATE: 02/28/1991
REVISED COMPLETION DATE : 02/28/1991
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	67901	69795	57300	83300	48485	55685
TOTAL COSTS	73623	75517	57300	83300	48485	55685

PROJECT: R20701881 TITLE : BRIDGE INSPECTION AUTOMATION
SECTION: TECH/TRAN INVESTIGATOR: BOULOS
CLIENT : STRUCTURES
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 1000
ACTUAL STUDY PROPOSAL AMOUNT : 443
APPROVED ORIGINAL BUDGET AMOUNT: 75000

PROJECT INITIATION DATE : 03/23/1989
STUDY PROPOSAL DUE : 09/19/1989
STUDY PROPOSAL COMPLETED: 05/01/1989
STUDY PROPOSAL APPROVED : 05/22/1989
ORIGINAL COMPLETION DATE: 07/01/1990
REVISED COMPLETION DATE : 07/01/1990
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	24312	24312	30000	51000	25385	25385
TOTAL COSTS	24523	24523	53000	75000	44846	44846

PROJECT: R20801881 TITLE : INSP & EVAL TOOLS FOR BRIDGES
SECTION: STRUCTURES INVESTIGATOR: DR. FU
CLIENT : STRUCTURES
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 8000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 182000

PROJECT INITIATION DATE : 04/07/1989
STUDY PROPOSAL DUE : 10/04/1989
STUDY PROPOSAL COMPLETED: 09/26/1989
STUDY PROPOSAL APPROVED : 11/22/1989
ORIGINAL COMPLETION DATE: 05/31/1991
REVISED COMPLETION DATE : 05/31/1991
REVISION NUMBER : 0

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	16557	16557	55000	150000	46538	46538
TOTAL COSTS	17222	17222	66000	182000	55846	55846

PROJECT: R20901881 TITLE : PROOF TESTING OF HIGHWAY BRIDGES
SECTION: STRUCTURES INVESTIGATOR: SARIDIS
CLIENT :
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 6000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 0

PROJECT INITIATION DATE : 08/18/1989
STUDY PROPOSAL DUE : 02/14/1990
STUDY PROPOSAL COMPLETED: 11/11/1911
STUDY PROPOSAL APPROVED : 11/11/1911
ORIGINAL COMPLETION DATE: 11/11/1911
REVISED COMPLETION DATE : 11/11/1911
REVISION NUMBER : 1

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	5097	5097	6000	6000	5077	5077
TOTAL COSTS	5097	5097	6000	6000	5077	5077

PROJECT: R21001881 TITLE : DESIGN OF LEACHING BASINS
SECTION: TECH/TRAN INVESTIGATOR: LICHTER
CLIENT : REGION 10
CONTRACTOR :

APPROVED STUDY PROPOSAL AMOUNT : 6000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 0

PROJECT INITIATION DATE : 01/29/1990
STUDY PROPOSAL DUE : / /
STUDY PROPOSAL COMPLETED: 03/31/1990
STUDY PROPOSAL APPROVED : 02/14/1990
ORIGINAL COMPLETION DATE: 03/31/1992
REVISED COMPLETION DATE : 03/31/1992
REVISION NUMBER : 1

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	No Ias Costs on File		0	71500	0	0
TOTAL COSTS	No Ias Costs on File		0	71500	0	0

PROJECT: R21101881 TITLE : INC PAINT REM WASTE LOW-STRGTH CONC
SECTION: MATER./PAVING INVESTIGATOR: DOODY
CLIENT : FACILITIES DESIGN DIVISION
CONTRACTOR :

PROJECT INITIATION DATE : 02/02/1990
STUDY PROPOSAL DUE : 08/01/1990
STUDY PROPOSAL COMPLETED: 02/02/1990
STUDY PROPOSAL APPROVED : 02/21/1990
ORIGINAL COMPLETION DATE: 03/31/1991
REVISED COMPLETION DATE : 03/31/1991
REVISION NUMBER : 0

APPROVED STUDY PROPOSAL AMOUNT : 5000
ACTUAL STUDY PROPOSAL AMOUNT : 0
APPROVED ORIGINAL BUDGET AMOUNT: 100000

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	No Ias Costs on File		0	5000	0	0
TOTAL COSTS	No Ias Costs on File		0	5000	0	0

TOTAL STATISTICS FOR DATABASE

	ACTUAL EXPENDITURES		PROGRAMMED EXPENDITURES			
	YTD	LTD	YEAR TOTAL	LIFE TOTAL	YTD SCALED	LTD SCALED
PERSONAL SERVICE	863924	3801642	1170400	5266989	990338	4429977
TOTAL COSTS	897688	4108407	1204400	5711750	1019108	4847508

SECTION III

EXPERIMENTATION PROGRAM
PRE-PROJECT PLANNING

PROJECT: 209-1 PROOF TESTING OF HIGHWAY BRIDGES

PROJECT MANAGER: P. Saridis

STUDY PROPOSAL APPROVED: Being Drafted

PROBLEM: Bridge load rating is an analytical process by which the load capacity of a structure is estimated based on assumptions about the material properties and structural behavior. This process is conservative and generally satisfactory. Nevertheless, a small percentage of bridges fail to rate by this method, that is, their estimated load capacity is less than that required to carry legal highway traffic even though the structure is carrying loads without evidence of distress. A positive demonstration of minimum load carrying capacity can be provided by subjecting the structure to a load larger than that expected in service. This proof load is selected to assure some minimum level of reserve strength, allowing the structure to continue in service carrying legal traffic.

OBJECTIVE: The objective of this project is to develop an efficient and cost effective load rating program based on proof loading. Such a methodology would be used only on bridges which were rated structurally deficient by conventional analytical methods.

SCOPE: Work to be performed by the Engineering Research and Development Bureau will be directed towards providing the Structures Design and Construction Division with technical information on the development and implementation of proof loading programs. This work will include a thorough evaluation of proof loading methodologies found in the literature and those used in other states and countries. Also, a detailed economic analysis including the cost of equipment and actual tests, and expected savings will be undertaken. The report will summarize this information and if the economic analysis is supportive the information would be used to promote a proof loading program.

STATUS: The study proposal will be submitted early in FY 1990-91. The monies requested in this write-up are for completion of the study proposal. The study proposal will detail the funds needed to conduct the study.

ESTIMATED EXPENDITURES FOR FY 1990-91: $1,000

CLIENT: Structures Design and Construction Division

PROJECT: 210-1 DESIGN OF LEACHING BASINS

PROJECT MANAGER: V.A. Lichter

PROBLEM: Local regulations in some areas, notably Long Island, require storm water runoff be diverted to ground water. Surface techniques such as recharge basins which contain the runoff water while it infiltrates have been used. Urbanization has made the large plots of land needed for these methods unavailable. Subsurface methods such as wells and seepage pits (locally called leaching basins) are being used as alternatives. The capacities and placement limitations need to be found for accurate design.

OBJECTIVE: Develop a methodology for the design of subsurface recharge structures which would determine the capacities and placement restrictions of a chosen structure.

SCOPE: Develop an understanding of the infiltration process for these geometries and the governing flow equations. Validate the theoretical results with field data. Develop guidelines to determine the capacities and placements for different permeabilities.

STATUS: A study proposal will be submitted in FY 1990-91. The monies requested are for this purpose. The proposal will detail funds needed for the study.

ESTIMATED EXPENDITURES FOR FY 1990-91: $6,000

CLIENTS: Region 10 (Hauppauge)

PROJECT: 211-1 INCORPORATION OF PAINT REMOVAL WASTE INTO LOW-STRENGTH CONCRETE

PROJECT MANAGER: M.E. Doody

STUDY PROPOSAL APPROVED: Being Drafted

PROBLEM: NYSDOT'S annual bridge painting contracts generate about 9000 bbl of waste from removal of lead-based paint. Disposal of these wastes, most of which are now designated as hazardous, costs as much as $2 million per year. Landfill availability for hazardous waste disposal continues to decline.

OBJECTIVE: Investigate the possibility of reducing the quantity of waste material by separating paint from sandblasting material. Investigate the cost effectiveness, impact on concrete properties, and impact on environments by incorporating the paint waste into low-strength concrete. Also, look at other feasible alternatives for disposing of paint waste.

SCOPE: A full-scale analysis of costs and regulatory issues will be performed regarding implementation of this idea. The impact on engineering properites of concrete and the environment will be assessed. In addition, ways of separating lead-based paint from sandblasting mixtures in order to reduce the amount of hazardous waste will be investigated. Alternatives of disposing of paint waste other than landfilling and incorporating into concrete, such as incorporating into asphalt concrete will also be reviewed and studied.

STATUS: The monies requested in this write-up are for the completion of the study proposal which is being drafted. The study proposal will detail the funds needed to conduct the study.

ESTIMATED EXPENDITURES FOR FY 1990-91: $5,000

CLIENT: Facilities Design Division

SECTION IV

PROPOSED PROJECTS NOT YET INITIATED

88-17 PROOF TESTING OF HIGHWAY BRIDGES
Research Project 209-1 (Pre-Project Planning)

PROBLEM: Bridge load rating is an analytical process by which the load capacity of a structure is estimated based on assumptions about the material properties and structural behavior. This process is conservative and generally satisfactory. Nevertheless, a small percentage of bridges fail to rate by this method, that is, their estimated load capacity is less than that required to carry legal highway traffic even though the structure is carrying loads without evidence of distress. A positive demonstration of minimum load carrying capacity can be provided by subjecting the structure to a load larger than that expected in service. This proof load is selected to assure some minimum level of reserve strength, allowing the structure to continue in service carrying legal traffic.

OBJECTIVE: The objective of this project is to develop an efficient and cost effective load rating program based on proof loading. Such a methodology would be used only on bridges which were rated structurally deficient by conventional analytical methods.

BENEFITS: The existence of this procedure would permit a rational evaluation of the actual load carrying capacity of the structure and eliminate the rehabilitation, replacement or posting of adequate and reliable structures.

CLIENT: Structures Design and Construction Division

88-12 EVALUATION OF ALTERNATIVE PAVING MATERIALS & MIXES
Research Project 203-1 (Pre-Project Planning*)

PROBLEM: New York State Department of Transportation is being requested by various producers, chemical companies, and the State Legislature to evaluate a host of products. The claim is that these products will enhance asphalt pavement service lives. The Department's present method of evaluation is inefficient and often inconclusive. An alternative procedure which can evaluate the products more efficiently is required.

OBJECTIVE: The objective of this study is to develop and demonstrate the feasibility of a procedure to evaluate alternative materials more efficiently.

BENEFITS: Alternative paving materials have the potential to increase pavement service lives. Since asphalt construction is a big item in New York, a modest increase in service lives can be very beneficial.

CLIENT: Materials Bureau

*NOTE: The completion of the study proposal for Project Number 203-1 will be funded with 100 percent State monies.

88-23 SCOUR INSPECTION OF BRIDGES

PROBLEM: The failure of the Schoharie Creek bridge has been attributed to loss of pier support resulting from scour. An inspection performed the previous year, which included probing around the foundation, indicated no scour holes. Historical records for this site clearly demonstrate that scour has been a continuing problem and suggests that scour holes were not detected because they had been filled with redeposited material. Redeposited material is likely to be poorly compacted and more susceptible to scour than in situ soil. Inspection methods are needed that reliably and inexpensively identify changes in foundation conditions resulting from refilled scour holes.

Currently available underwater inspection tools such as ground penetrating radar, fathometers and seismic reflection profiling have shown limited ability to identify refilled holes. Considerable interpretation skill is required with these methods, and no single device has been demonstrated to be universally effective.

OBJECTIVE: A comprehensive study of methods for identifying the severity of scour experienced at existing bridge sites is needed. In particular, inspection methods which are based on measurements of changes in structure dynamic behavior rather than direct identification of refilled holes will be explored.

BENEFITS: Because of the ability of the proposed methodology to provide both a quantitative and real time assessment of foundation condition the potential payoff is believed to be high. The number of State owned bridges susceptible to scour is estimated to be upwards of one thousand. The consequences of failure of even one bridge is clearly great and the urgency of this work is high.

CLIENT: Structures Design and Construction; Inventory and Inspection Bureau.

NOTE: This proposed study may be addended to Project 208-1, "Inspection and Evaluation Tools for Bridges." If it is, an addendum to the study proposal for Project 208-1 will be submitted.

88-10 DEVELOPMENT OF ROADSIDE CLEAR ZONE POLICY

PROBLEM: Since the Comparative Negligence Statute was passed, it has become increasingly difficult to defend any action in the Court of Claims which involve a variance from stated standards, however slight it may be. Presently, the New York State Dept. of Transportation Design Manual calls for a 30 ft. clear zone in most situations on new highway construction, but this standard cannot be applied directly to rehabilitation projects. At this time, defensible procedures are not available to determine CZ widths for use in New York State on 3R and similar projects. Design Manual standards are based on very limited data, are directed toward new construction, and are not practical to implement on most existing roadways. Therefore, research is needed to develop clear zone standards for work on existing roadways. A preliminary study to relate roadside accident rates to roadside conditions is nearly complete. However, a second phase is needed to develop design values for clear zones based on the accident rates developed in phase I.

OBJECTIVE: To develop specific roadside clear zone guidelines for use on 3R and other rehabilitation projects.

BENEFITS: Although calculation of specific benefits is not possible at this time, this project will permit the determination of cost-effective roadside clear zone width for a given project. An acceptable level of roadside safety will thus be achieved at the lowest possible construction cost, and the decision-making process will be defensible if tort claims arise.

CLIENT: Facilities Design Division

89-18 INCORPORATION OF PAINT REMOVAL WASTE INTO LOW-STRENGTH CONCRETE
Research Project 211-1 (Pre-Project Planning)

PROBLEM: NYSDOT's annual bridge painting contracts generate about 9000 bbl of waste from removal of lead-based paint. Disposal of these wastes, most of which are now designated as hazardous, costs as much as $2 million per year. Landfill availability for hazardous waste disposal continues to decline.

OBJECTIVE: Investigate the possibility of reducing the quantity of paint waste by separating paint from sandblastings. Investigate the cost effectiveness, impact on concrete properties, and impact on environments by incorporating the paint waste into low-strength concrete. Also look at other feasible alternatives for disposing of paint waste.

BENEFITS: Savings in disposal cost to the Department as well as elimination of landfill and environmental problems are potential benefits.

CLIENTS: Facilities Design Division

89-42 EFFECTS OF TITANIUM DIOXIDE (TiO2) CONTENT ON TRAFFIC PAINT PERFORMANCE

PROBLEM: Titanium dioxide is the principal white pigment used in traffic paint, and one of the most expensive components. The coatings industry is currently experiencing a shortage of this product, accompanied by a sharp increase in price. A solution to reduce the already expensive pigment cost, and to avert the current shortage, is to decrease the titanium dioxide content, replacing it with a mineral filler such as calcium carbonate. However, the effects of such changes on paint durability are unknown, and it may not be possible to obtain acceptable performance.

OBJECTIVE: The objective of this research will be to optimize TiO2 content in the Department's standard traffic paints in terms of cost and performance.

BENEFITS: The Department currently purchases nearly 500,000 gallons of white traffic paint annually. Reduction in the quantity of TiO2 could easily save $0.50 to $1.00 per gallon, for an annual savings of $250,000 to $500,000. If the current shortage continues as is anticipated, the averted extra cost would be nearly $1 million annually.

CLIENT: Highway Maintenance Division

NOTE: Steps have been taken to submit this proposed study to the University Research Technology Center Program. It is anticipated that Engineering Research and Development Bureau would become involved with field tests.

89-38 DETERMINING OVERLOAD CAPACITY OF BRIDGES

PROBLEM: The load capacity evaluation process must consider both design loads and the extraordinary loads created by permit vehicles. Bridges capable of carrying normal highway traffic but incapable of carrying the larger annual permit loads are restricted for permit vehicles (the R-permit bridges). The criteria for load capacity evaluation for R-permits must necessarily be different because of the difference in frequency of overload. For example, a bridge posted at a level less than the AASHTO design load can be expected to experience illegal loads at a frequency that increases as posting level decreases. R-permit posted bridges, by contrast, are overstressed by a much smaller proportion of vehicles in the traffic stream. This difference in overload frequency should be reflected in the load evaluation process.

OBJECTIVE: Develop an analytical procedure using load and resistance factor methods which will accurately quantify these different overload environments and establish criteria for determining the need for R-permit postings.

BENEFITS:

a. The procedure will provide a standardized and efficient way to determine loading capacity of a bridge through use of a microcomputer program.

b. The procedure will provide more rational and consistent load rating criteria.

c. The procedure will allow a less restricted use of the overload permit program.

d. The procedure will provide a safe and more cost-effective use of bridges.

CLIENT: Structures Design and Construction Division

89-37 GUIDELINES FOR INTEGRATING LOAD TEST RESULTS INTO BRIDGE LOAD RATINGS

PROBLEM: Equipment and methods for load testing bridges are well developed and permit rapid and inexpensive experimental determination of bridge behavior under load. Use of load test results in establishing a bridge's safe load capacity is not so well developed. Explicit guidelines are needed to provide a rational process of integrating field test results into the load rating process.

OBJECTIVE: Develop specific guidelines for integrating results from a physical load test of a bridge into the analytical load rating process.

BENEFITS: Physical load tests generally show a larger load-carrying capacity than is predicted analytically. The needed guidelines will permit effective use of this capacity and should result in a decrease in the number of posted bridges.

CLIENT: Structures Design and Construction Division.

89-26 DESIGN OF LEACHING BASINS
Research Project 210-1 (Pre-Project Planning)

PROBLEM: The existing regulations in some urban jurisdictions in New York, notably counties and towns on Long Island, require that all storm water be recharged by diverting the surface runoff into ground water. Artificial recharge is accomplished by two main techniques: surface (recharge basins) and subsurface (leaching basins, diffusion wells). The Engineering Research and Development Bureau published Research Report 69-2, which discusses the feasibility, design, construction, and maintenance of recharge basins. Urbanization of Region 10 (Hauppauge), however, made the land required for recharge basins prohibitively expensive. This has led to replacement of recharge basins with leaching basins. Leaching basin capacity is not known, because neither experimental nor theoretical investigations have been conducted on infiltration design of these structures.

OBJECTIVE:
a. Develop an understanding of how storm water recharge is accomplished by leaching basins.
b. Develop a theory for determination of leaching basin infiltration rates.
c. Validate theoretical results with field data.
d. Recommend practices for construction and maintenance of leaching basins.
e. Develop charts of the maximum area that a leaching basin can drain for different values of permeability.
f. Address the related environmental issues.
g. Develop a user-interactive computer program to assist in design of leaching basins.

BENEFITS: The main benefit from this project will be the accurate design of leaching basins, making the recharge process more efficient. This will encourage future use of subsurface techniques having these advantages:

1. Minimal land requirements.
2. Greater effectiveness in creating freshwater barriers in coastal aquifers against intrusion of saltwater from the sea.
3. Leaching basins can be built to supply water to two or more aquifers simultaneously, and where hydraulic conditions permit can be used as passive connectors between adjacent aquifers separated by impermeable material.
4. Access to deeper aquifers.

CLIENT: Region 10 (Hauppauge)

89-41 EVALUATION OF DESIGN METHODS FOR SPRAYED SEALS

PROBLEM: "Bituminous surface treatment" is a term used to describe application of bituminous emulsion and stone to a prepared road. Success of a surface treatment depends on good design and construction practices. Because the engineer in charge (EIC) has control of both design and construction of surface treatments, EIC knowledge and experience significantly affect the treatment's quality. This results in nonuniform performance and use of bituminous surface treatments across New York State. For surface treatments to be a cost-effective part of New York's maintenance effort, more consistent design and construction procedures are needed. The Australian Road Research Board (ARRB) has developed an expert system for design of bituminous surface treatments. This system uses a computerized knowledge base to design a surface treatment for any road condition. If the expert system is compatible with New York's practices, it will provide a consistent information base to improve the quality of bituminous surfacing.

OBJECTIVE: a. Examine compatibility of the ARRB expert system with New York's practices and environment.

b. Compare the ARRB expert system with procedures used elsewhere in the United States.

c. Evaluate the differences that may be found.

BENEFITS: A more consistent and rational design method for bituminous surfacings. The expected service life of these treatments should increase and related maintenance costs decrease.

CLIENT: Highway Maintenance Division.

NOTE: This proposed study has also been referred to as "Evaluation of the Expert System for Sprayed Seals of the Australian Road Research Board" and "Evaluation of Australian Design Method for Sprayed Seals." The new title reflects the awareness of other design methods for sprayed seals being used in France and Florida.

SECTION V

POOLED HPR FUND PROJECTS

EXPERT SYSTEMS FOR HIGHWAY APPLICATIONS
HPR-2 (145)

Computer programs that include simulation of the reasoning and problem-solving process of human experts are commonly known as expert systems. Expert systems offer a means to capture the knowledge and experience of current professionals and organize, save, and apply this information to further the highway program. These programs cannot replace the human expert, decision maker or trainer; they are instead valuable tools for transportation specialists to use to expand their effectiveness. This technology is gaining acceptance in many industries, however, expert systems have not gained the prominence they deserve in highway engineering.

This study is to survey current expert systems activities, review state-level needs and application areas (research, planning, engineering, construction and maintenance, and management), and then select and develop two candidate expert systems. Candidate expert systems may include (but are not limited to): identification of delineation strategies, construction site layout for materials storage, work-zone signing and delineation, warrants for safety devices, etc.

New York State Contributions:
- FFY 1990 - $20,000
- FFY 1991 - $20,000

EFFECTIVENESS OF DEMAND MANAGEMENT STRATEGIES
HPR-2 (154)

Strategies to alleviate traffic congestion in urban areas fall into two basic categories: those that increase the supply or traffic carrying capability of the roadway system and those that decrease traffic demand on the roadway system. Application of both types of strategies is generally required to solve urban congestion problems. Typical demand reduction strategies include management of available parking, employer-based promotion of ridesharing and mass transit, and ordinances and incentives for employers and developers to reduce traffic demand to employment sites.

This study will develop, test, and refine a package of guidance materials that can be used by public and private agencies to develop, implement, and evaluate cost-effective traffic demand management (TDM) programs. This package will include a "how-to" manual, a report containing case studies of eight successful TDM programs around the United States, and a microcomputer tutorial on selecting and implementing an appropriate TDM program for given local conditions. If available funds permit, a 15-minute promotional videotape on TDM strategies aimed at upper-level management and decision makers will also be prepared.

New York State Contributions:
FFY 1990 - $20,000

GRADATION TESTING OF ASPHALT MIXES
HPR-2 (153)

The accurate determination of the gradation and asphalt content of asphalt mixes is a necessary part of assuring the desired performance of the resulting pavement. While nuclear gauge testing can now be used to determine asphalt content, the only reliable method for determining the gradation of asphalt mixtures is to perform extraction tests. Extraction tests require the use of hazardous solvents which are difficult to handle and dispose. For this reason it is desirable to 1) reduce the number of extractions necessary to accurately predict the performance of the mix, or 2) find an acceptable non-hazardous solvent to be used in the extraction testing. To accomplish this, a study is proposed to:

1. Establish the minimum amount of extraction testing that is needed to develop correlation factors between extraction testing and cold-feed gradations for the minus 200 material. This should be accomplished for plants with both wet scrubbers and baghouses.

2. Verify the repeatability and required extraction test modifications using promising non-hazardous terpene materials and compare the results with tests using the chlorinated solvents.

New York State Contributions:
FFY 1990 - $6,000
FFY 1991 - $6,000

New York State Department of Transportation
Engineering Research and Development Bureau

GUIDELINES FOR DEVELOPING AND IMPLEMENTING A PUBLIC SAFETY AWARENESS CAMPAIGN
HPR-2 (152)

Highway authorities have become alarmed by recent trends which suggest a gradual deterioration of respect for traffic regulations and traffic control devices by the general public. This holds true for the frequent disregard of STOP controls, Right-Turn-On-Red requirements, YIELD signs, and especially for the critical traffic controls in construction and maintenance zones. Enforcement techniques have had limited success in reversing this trend and voluntary compliance with the traffic laws and ordinances is believed to be the only effective solution to this safety and operational problem. Highway agencies have made some efforts to communicate with the public to achieve better compliance with traffic control measures, but the techniques for developing and implementing public awareness campaigns are not uniform nor are they well publicized.

Develop a user's manual for planning, designing, and implementing public awareness programs to obtain the public's respect for traffic control devices.

New York State Contributions:
FFY 1990 - $4,000
FFY 1991 - $4,000

NATIONAL GEOTECHNICAL EXPERIMENTATION SITES
HPR-2 (150)

During the last two or three decades, the geotechnical profession has witnessed major changes in the approach to site characterization and quantification of soil behavior. The development of new in situ testing methods has provided valuable information to complement or substitute for laboratory testing methods which lead to a better understanding of soil properties. However, duplication of effort and lack of cooperative work between the various research groups has made progress slower and more costly than might otherwise have been possible. A major problem has been encountered in the evaluation of new in situ testing methods, which require the use of well-characterized and documented sites as a reference guide. Each originator of a new method must perform extensive site investigation before reaching the main objectives of the research, thus increasing the total project cost and time. Sites which are already well characterized and permanently instrumented will reduce the cost and commitment of time by allowing researchers to build on the work of others.

Furthermore, such site development will permit an exchange of information and ideas among researchers and practitioners that should tend to focus the thought processes of geotechnical engineers into more definable channels than presently exist because these individuals will be comparing hypotheses, theories, and testing procedures and mathematical models against the same reality. This, in turn, should lead to better means of communicating the effects of geotechnical phenomena to the geotechnical community, thereby reducing the high level of misunderstandings, inconsistencies, empiricism, and untested theory that pervade geotechnical practice today.

The establishment of one or more national geotechnical experimentation sites will produce more cooperation between public agencies, universities, and private sector groups -- something which has been missing in the past. In addition to providing a standardized base to judge the results of new research, it will provide research sponsors with more accountability than in the past because investigators will know that others can come to the same site and attempt to repeat the experiment.

Research is needed to select and characterize several sites around the country using state-of-the-art sampling and testing techniques. A system management program must also be established to develop a strategy to ensure a) maximum and appropriate utilization of each site, b) maximum exchange of geotechnical information about each site among users, and c) minimum costs to users. A system management board and an overall system manager will be appointed to execute the policies and coordinate usage of the sites.

New York State Contributions:

FFY 1990 - $10,000
FFY 1991 - $ 5,000
FFY 1992 - $ 5,000

TESTING OF SMALL AND LARGE SIGN SUPPORTS
HPR-2 (144)

This study will involve the testing of both small and large sign supports selected by the participating states. A preliminary test plan will be developed under a separate ongoing study. This plan will include information on the types of designs in common use by the states and a basic structure for the test program. This will be used as input to the participating states in the final selection of sign supports. Selected sign supports will be tested at the Federal Outdoor Impact Laboratory in accordance with the new breakaway requirement for sign and luminaire supports. Individual test reports will be prepared for each sign support tested, as well as overall summary reports.

New York State Contributions:

FFY 1990 - $15,000
FFY 1991 - $15,000
FFY 1992 - $10,000

New York State Department of Transportation
Engineering Research and Development Bureau

TESTING OF STATE ROADSIDE SYSTEMS
HPR-2 (146)

States often require unique treatments for specific roadside safety problems. The development of these treatments involve the design and testing of safety hardware. This study will provide a means for interested States to get assistance in the design and testing of roadside hardware. Interested States would work with the research contractor and FHWA personnel to develop the required hardware. This would be funded by the State through a contribution to the pooled fund study equal to the cost of the effort. Only States requiring assistance would contribute. FHWA would provide staff assistance only; no FHWA contract funds would be included in the study.

New York State Contributions:

Obligated funds for this study will be equal to the cost of any requested testing.

NOTE: At present there is a request to test a bridge rail. This may require 5 series of tests. Initially $30,000 has been estimated for the first test of the first series.

SECTION VI

ADMINISTRATION/TRAINING

PROJECT: 10-01 Administration

SCOPE: A variety of recurring activities are required to administer the Bureau's research program. Charges are made on the basis of the particular service provided or function performed within the following categories:

Managerial Operations: These are the day-to-day activities which involve aspects of this Bureau's administration (e.g., inquiries, explanations, and justifications) which must be delegated, clarified, followed up, and finally resolved. These activities also deal with the broad general aspects of administration such as policy, procedures, balance, and funding of the research program. These tasks are performed exclusively by the Director, Assistant Director, Section Heads, and Administrative Assistant. The level of effort varies among these individuals depending on their specific responsibilities and assignments.

Program Development: Efforts required to prepare and publish the Bureau's annual State Budget Requests, the Federal Highway Planning and Research Work Program, and the submission of appropriate projects for consideration in the National Cooperative Highway Research Program (NCHRP), or to FHWA for consideration for administrative contract work, pooled-fund studies, or FHWA Research are charged to this function.

Program Control: Activities under this function involve monitoring expenditures and work accomplished in relation to projected progress schedules and budgeted costs. It also concerns efforts directed toward ensuring that the research remains within the stated scope and objectives, and that marginal work or work which no longer is considered necessary by the requesting program manager is terminated.

Library and Publication Support: This includes maintaining the Bureau's library of research publications, accessing TRIS data files in order to do online literature searches, and retrieving documents from other libraries across the country. Publication support involves activities such as production control and maintaining inventory of Bureau publications, maintaining report manuscripts, and editing research reports.

STATUS: Continuing

ESTIMATED EXPENDITURES FOR FY 1990-91: $220,000

CLIENTS: N/A

PROJECT: 16-0 TRAINING

PROBLEM: N.A.

OBJECTIVE: N.A.

The following describes training that was completed by Bureau staff during FY 1989-90.

1. Michael Doody completed a course in "Corrosion Control" at RPI.

2. Everett Dillon and William Roth attended a half-day seminar presented by Fluke Instrumentation Corporation on digital storage oscillioscopes.

3. Ashley Tyrell completed a course on "Economic Analysis for Public Administration" at SUNY at Albany.

4. Michael Loftus attended a week long seminar at Union College. The seminar entitled "Applied Instrumentation and Measurements Engineering" dealt with issues directly related to Research Project 208-1 as well as the ongoing program of the Structures Section.

5. Hong-Jer Chen attended an FHWA sponsored course, "Pavement Design and Management", at Michigan State University.

6. Michael Loftus attended a two-day course on the use of SMS STARstruct Modal Analysis software.

7. Michael Gray completed a course entitled "Foundation Engineering" offered by the Soils Bureau.

8. Daniel Merkel attended a seminar on the use of DIALOG.

9. Julie Tarter completed a course on "Structural Dynamics" at RPI.

10. The following staff attended Department sponsored training:

-Michael Loftus - Technical Manager
-Prasanta Gupta - Technical Manager
-Michael Gray - Supervisory Training
-Ashley Tyrell - Supervisory Training
-Peter Weykamp - Supervisory Training
-Youla Saridis - Writing
-Michael Doody - Sexual Harassment
-Hong-Jer Chen - Sexual Harassment
-Ashley Tyrell - Oral Communications
-Peter Weykamp - Tips on Teaching
-Fred Hiss - VDT Training
-Julie Tarter - VDT Training
-Idris Aziz - VDT Training
-Ashley Tyrell - VDT Training
-Richard Morgan - VDT Training
-Jan Fortuniewicz - VDT Training

11. The Bureau, in cooperation with Paul Mack and Jim McDonald of the Region One Construction Group, has afforded several Junior Engineers the opportunity to gain experience with on-site field construction activities. The following employees participated in this joint effort:

Julie Tarter - Route 20/NYS Thruway Project
Hong-Jer Chen - Route 5 Central Avenue Reconstruction Project
Dan Muscatell - I-787 City of Albany Reconstruction Project
Michael Doody - Route 146 Halfmoon R & P Project
Prasanta Gupta - Route 144 Bethlehem Rubberized Asphalt Project

12. Initial training on the use of portable computers during bridge inspections was provided to three bridge inspectors.

13. Everett Dillon in conjunction with the Highway Maintenance Division conducted a training program on salt spreader calibration procedures. The training was held over a two-week period in one residency in each region across the state. These sessions were intended to facilitate the implementation of standardized calibration procedures which had been developed by the Research Bureau.

STATUS: Continuing

ESTIMATED EXPENDITURES FOR FY 1990-91: $25,000

CLIENTS: N.A.

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